



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,961	06/08/2001	Anthony J. Ruggiero	IL-9928	2189

7590 09/22/2004

Eddie E. Scott  
Assistant Laboratory Counsel  
Lawrence Livermore National Laboratory  
P.O. Box 808, L-703  
Livermore, CA 94551

EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/877,961

Applicant(s)

RUGGIERO, ANTHONY J.

Examiner

Kaj K Olsen

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-35 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 28, 29 and 33-35 is/are allowed.  
6) ☒ Claim(s) 1, 3-12, 15-24, 27 and 30 is/are rejected.  
7) ☒ Claim(s) 13, 14, 25, 26, 31 and 32 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

DETAILED ACTION

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-12, 15-20, 24, 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krattiger et al (Anal. Chem. 1994, 66, pp. 1-8) in view of Faubel. Krattiger is being cited and relied on for the first time with this office action.

3. Krattiger discloses a sensor system comprising a capillary separation channel, an interferometer, a light source, and at least one photoreceiver. See fig. 1 and the paragraph beginning "Principle of Operation". Krattiger does not explicitly disclose making the excitation beam to be modulated. Faubel discloses in an alternate interferometer that making the excitation beam modulated allows one to lock-in to the detected signal, which improves signal analysis (fig. 1 and p. 3557). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Faubel for the sensor system of Krattiger in order to improve signal analysis.

4. With respect to the sensor system being "microelectronic" or "integrated", these terms have no explicit structural meaning that reads away from the references.

5. With respect to the different uses of the separation channels, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. However, see Faubel introduction.

Art Unit: 1753

6. With respect to the rate of chopping, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.
7. Faubel also teaches the use of argon ion lasers for the excitation beam (p. 3557, col. 1, first full paragraph).
8. With respect to the appropriate optical path distance or choice of laser frequency, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the set forth path distance and laser frequency, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.
9. With respect to claims 17, 19, and 24, these claims merely recite an intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.
10. With respect to claim 18, white light is a conventional light source that is less expensive than the lasers of the references. Use of a more inexpensive source of light requires only routine skill in the art.
11. With respect to claim 27, it would appear that both beams of the interferometer are directed into the separation capillary (see fig. 3).
12. With respect to method claim 30 (those limitations not covered above), Krattiger is drawn to the measuring of refractive indexes and any capillary inherently has first end and exit ports. See principle of operation.
13. With respect to claim 16, this claim was previously not included on the listing of claims rejected. However, this was inadvertent and the examiner is now including that claim in the list

Art Unit: 1753

of rejected claims. The intent to reject this claim can be noted by paragraph 17 of the previous office action (also printed above).

14. Claims 1, 3-12, 15-20, 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandenburg et al (Sensors and Actuators B 38-39, 1997, pp. 266-271) in view Faubel. Brandenburg is being cited and relied on for the first time with this office action.

15. Brandenburg discloses a sensor system comprising a separation channel (for liquid chromatography), an interferometer, a light source, and at least one photoreceiver. See fig. 2 and "Principle of operation" on p. 267. Brandenburg does not explicitly disclose making the excitation beam to be modulated. Faubel discloses in an alternate interferometer that making the excitation beam modulated allows one to lock-in to the detected signal, which improves signal analysis (fig. 1 and p. 3557). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Faubel for the sensor system of Krattiger in order to improve signal analysis.

16. With respect to the sensor system being "microelectronic" or "integrated", these terms have no explicit structural meaning that reads away from the references.

17. With respect to the different uses of the separation channels, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. However, see Faubel introduction.

18. With respect to the rate of chopping, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

19. Faubel also teaches the use of argon ion lasers for the excitation beam (p. 3557, col. 1, first full paragraph).

Art Unit: 1753

20. With respect to the appropriate optical path distance or choice of laser frequency, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the set forth path distance and laser frequency, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

21. With respect to claims 17, 19, and 24, these claims merely recite an intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

22. With respect to claim 18, white light is a conventional light source that is less expensive than the lasers of the references. Use of a more inexpensive source of light requires only routine skill in the art.

23. With respect to claim 16, this claim was previously not included on the listing of claims rejected. However, this was inadvertent and the examiner is now including that claim in the list of rejected claims. The intent to reject this claim can be noted by paragraph 28 of the previous office action (also printed above).

24. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krattiger or Brandenburg in view of Faubel as applied to claim 20 above, and further in view of Burns et al (USP 6,379,929 B1).

25. The references set forth all the limitations of the claims, but did not explicitly set forth the presence of a plurality of sample processing equipment. Burns discloses in an alternate microfluidic device that sample processing equipment such as micro pumps, micro valves, and/or reagent cartridges are conventional in the art (col. 10, lines 39-49; col. 39, lines 1-15; col. 79,

Art Unit: 1753

lines 10-20). Said processing equipment facilitates the handling of fluids through the lab on a chip device and it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Burns for the sensor of Krattiger or Brandenburg in view of Faubel in order to automate the fluid handling for the sensor.

#### ***Allowable Subject Matter***

26. Claims 28, 29 and 33-35 are allowed.
27. Claims 13, 14, 25, 26, 31, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
28. The reasons for the allowable subject matter can be found in a previous office action.

#### ***Response to Arguments***

29. Applicant's arguments filed 6-24-2004 have been fully considered but they are not persuasive. In view of the submitted 131 declarations, the examiner is withdrawing the rejection drawn to the teaching of Bornhop. With respect to the rejections relying on the teaching of Krattinger, applicant urges that Krattinger fails to teach an interferometer arm orthogonally intersecting a separation channel at least once on an integrated chip or a modulated excitation beam having a wavelength. The examiner is confused by this assertion by the applicant because the applicant doesn't specifically argue why the examiner was in error in the previous office action (also printed above). To summarize Krattinger teaches the use of interferometer that intersects with the separation channel at least once (see fig. 1 and "Principle of Operation" on p.

Art Unit: 1753

2), so the reference clearly teaches having an interferometer arm that orthogonally intersects the separation channel. Moreover, the combination of capillary and glass plates would read on “integrated chip” giving the claim language its broadest reasonable interpretation. With respect to the modulated beam, that is the basis for the use of the secondary teaching of Faubel. Because the applicant hasn’t specifically rebutted any of these readings of the claim language onto Krattinger or Faubel, nor has the applicant specifically rebutted the combination of Krattinger and Faubel, it is unclear what the applicant is specifically objecting about the previous rejection. With respect to Brandenburg, applicant similarly argues without specifics that Brandenburg fails to teach the same claim language. To summarize an interferometer arm of Brandenburg orthogonally intersected a sample cell (see fig. 1). That sample cell is a flow through cell that is part of a liquid chromatography experiment (see abstract and fig. 2) so the sample cell is part of a separation channel. With respect to the “integrated chip”, that doesn’t appear to have any inherent reading away from the chip-like flow cell of fig. 2 (and the applicant hasn’t specifically rebutted such an interpretation). With respect to the modulated wavelength, that was the purpose of the teaching of Faubel and the applicant has not specifically rebutted that combination of references. Because the applicant hasn’t specifically rebutted any of these readings of the claim language onto Brandenburg or Faubel, nor has the applicant specifically rebutted the combination of Brandenburg and Faubel, it is unclear what the applicant specifically is objecting about the previous rejection.



Art Unit: 1753

*Conclusion*

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 5:30 A.M. to 3:00 P.M. and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

Art Unit: 1753

applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753  
September 17, 2004



**KAJ K. OLSEN**  
**PRIMARY EXAMINER**